

SERVICE MANUAL

QUARTZ PLL SYNTHESIZER TUNER

SANSUI T-E70/E70L



CAUTION

1. Parts identified by the \triangle symbol on the schematic diagram and the parts list are critical for safety. Use only replacement parts that have critical characteristics recommended by the manufacturer.
2. Make leakage-current or resistance measurements to determine that exposed parts are acceptably insulated from the supply circuit before returning the appliance to the customer.

•SPECIFICATIONS

FM Section

Tuning range.....	88 to 108 MHz
Usable sensitivity	
Mono IHE	10.8 dBf (1.9 μ V : T100)
DIN	0.9 μ V
50 dB quieting sensitivity	
Mono	16.5 dBf
Stereo	37.0 dBf
Signal to noise ratio at 65 dBf	
Mono	75 dB
Stereo	70 dB
Distortion at 65 dBf	
Mono	less than 0.2% at 1,000 Hz
Stereo	less than 0.25% at 1,000 Hz
Alternate channel selectivity (at 400 kHz)	
.....	55 dB
Stereo separation	40 dB at 1,000 Hz
Frequency response.....	30 to 15,000 Hz
.....	+1.0 dB, -1.5 dB
Antenna input impedance	
.....	(300 ohms balanced)
.....	75 ohms unbalanced

AM (MW) Section

Tuning range.....	530 to 1,600 kHz
Usable sensitivity	52 dB/m (398 μ V/m)
Signal to noise ratio	45 dB
Image response ratio	40 dB at 1,000 kHz

LW Section (T-E70L only)

Tuning range.....	153 to 281 kHz
Usable sensitivity	62 dB/m
Signal to noise ratio	45 dB
Image response ratio	35 dB at 220 kHz

Others

Output voltage and impedance	
.....	600 mV/2.2 kohms
Dimensions	380 mm (15")W
.....	67 mm (2-11/16")H
.....	227 mm (8-15/16")D
Weight	1.7 kg (3.7 lbs) net
.....	2.3 kg (5.1 lbs) packed

* Design and specifications subject to changes without notice for improvements.

Sansui

SANSUI ELECTRIC CO., LTD.

CAUTION

1. The symbols, UL, CSA, SA, BS, UK, EU, AS and XX on the parts list and the schematic diagram mean followings respectively.

UL..... Manufactured for U.S.A market.
 (Underwriters Laboratories approved model.)
 CSA Manufactured for Canadian market.
 SA..... Manufactured for South African market.
 BS, UK Manufactured for United Kingdom market.
 EU Manufactured for European market.
 AS..... Manufactured for Australian market.
 XX..... Standard Version.
 NON MARK Common Parts.

2. Some printed circuit boards are not supplied as the assembled.
 To separate these in this service manual, the stock No's are not indicated at the ends of the board names. However, the individual parts on the circuit boards are provided by orders.
3. Since some capacitors and resistors are omitted from parts lists in this service manual, refer to the Common Parts List for capacitors & resistors, which was issued on February 1983.
4. Abbreviations in this service manual are as follows.

•Abbreviations List

C.R. : Carbon Resistor	E.B.L. : Low Leak Bi-Polar
S.R. : Solid Resistor	Electrolytic Capacitor
Ce.R. : Cement Resistor	Ta.C. : Tantalum Capacitor
M.R. : Metal Film Resistor	F.C. : Film Capacitor
F.R. : Fusing Resistor	M.P. : Metalized Paper Capacitor
N.I.R. : Non-Inflammable Resistor	P.C. : Polystyrene Capacitor
A.R. : Array Resistor	G.C. : Gimmic Capacitor
C.C. : Ceramic Capacitor	A.C. : Array Capacitor
C.T. : Ceramic Capacitor,	V.R. : Variable Resistor
Temperature Compensation	S.V.R. : Semi Variable Resistor
E.C. : Electrolytic Capacitor	SW. : Switch
E.L. : Low Leak Electrolytic	Chip R. : Chip Resistor
Capacitor	Chip C. : Chip Capacitor
E.B. : Bi-Polar Electrolytic	
Capacitor	

1. BLOCK DIAGRAM



2. ADJUSTMENTS

• Required test equipment

1. The cassette deck amplifier (DA-E90 or DA-E70) which is completely adjusted.
2. Extended 13P and 10P ST connector cables.

2-1. FM Adjustment (See Figs. 2-1, 2-2 & 2-6)

- Note:** 1. Band Selector Switch FM
 2. Connect as shown Fig. 2-1.
 3. On steps 1, 2 & 3; FM MUTING/MODE OFF/MONO
 4. On step 4; FM MUTING/MODE ON/AUTO

Fig. 2-1

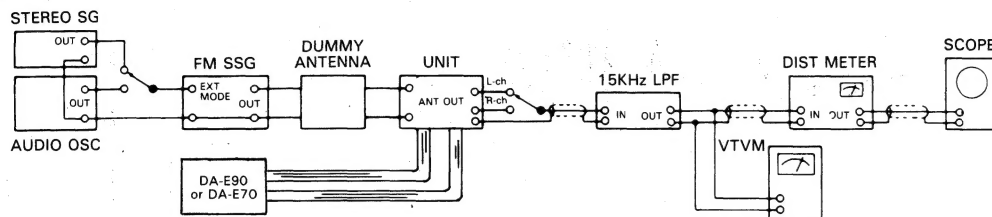
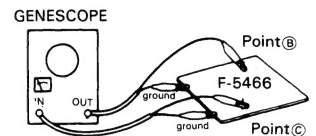


Fig. 2-2



STEP	SUBJECT	FEED SIGNAL		MEASURE OUTPUT	ADJUST	ADJUST FOR	REMARKS
		FROM	TO				
1.	IF Coil Adj.	98MHz ANT Input 20dBf (14.8dB), 1kHz (100% MOD.), FM SSG	ANT terminal 300Ω	Between Point (A) (Pin 13 of d1C1) & GND (F-5466) DC Volt Meter	IFT Coil (Front-end, F-5466)	Max. DC Volt	
2.	Discriminator Coil Adj. In case of using Genescope	Output 60dB, Genescope	Point (B) (dC1)	Between Point (C) (Pin 10 of d1C1) & GND (F-5466)	dT1 (F-5466)	Steep linearity of S curve. Make symmetrical S curve.	
	Discriminator Coil Adj. In case of using Dist meter	1) 98MHz ANT Input 65dBf (59.8dB), No MOD., FM SSG.	ANT terminal 300Ω	Between Point (D) and (E) (Across the dR14) (F-5466) DC Volt Meter	dT1 (F-5466)	DC 0V ± 30mV	• Repeat procedures as stated in subject 1) and 2).
		2) 98MHz ANT Input 65dBf (59.8dB), 1kHz (100% MOD.), FM SSG	Same as above	Output L or R-ch, Between Point (F) (Jumper wire JW15) or Point (G) (Jumper wire JW16) and GND Dist Meter & SCOPE		Min THD	
3.	LOCKED Indicator Level Adj.	98MHz ANT Input 23dBf (17.8dB), 1kHz (100% MOD.), FM SSG	Same as above	LOCKED Indicator	dVR1 (F-5466)	LOCKED Indicator turns ON.	
4.	PLL VCO Adj.	98MHz ANT Input 65dBf (59.8dB), FM SSG, No MOD.	Same as above	Between Point (H) (Pin 12 of d1C2) & GND (F-5466) Freq. Counter	dVR2 (F-5466)	19.000kHz ± 25Hz	

• ADJUSTMENT FOR FM

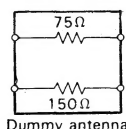
There are two kind in indication of FM SSG output attenuator

1. Attenuator with marking of 75Ω open open indication type.
2. Attenuator with marking of 75Ω load or close load or close indication type.

FM SG output level in this FM adjustment are described as open indication type.

To feed FM signal, a dummy antenna circuit as Fig. 2-3 must be connected between FM SG output and ANT terminal (300Ω) of the unit.

Fig. 2-3



Dummy antenna

- The following table shows relations among FM SG attenuator indication (dB), available power ratio (dBf) and antenna terminal voltage (dB/μV) in each indication type.

	FM SG Attenuator Indication	Available Power Ratio	Antenna Terminal Voltage
Open indication type	0 dB 66 dB	-0.8 dBf 65.2 dBf	-6 dB/μV 60 dB/μV
Load or close indication type	0 dB 60 dB	5.2 dBf 65.2 dBf	0 dB/μV 60 dB/μV

2-2. AM Adjustment (See Figs. 2-4, 2-5 & 2-6)

Note: Band Selector AM (T-E70), MW (T-E70L)

Fig. 2-4

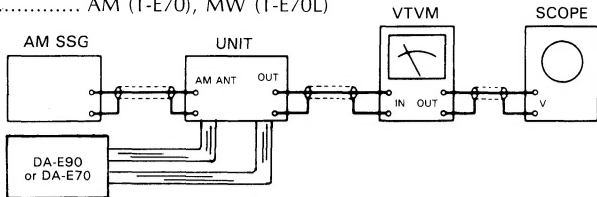
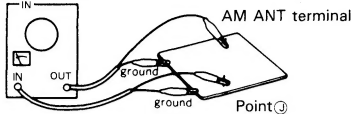


Fig. 2-5 GENESCOPE



1) AM IF Adjustment & MW (AM) Tuning Adjustment

STEP	SUBJECT	FEED SIGNAL		MEASURE OUTPUT	ADJUST	ADJUST FOR	REMARKS
		FROM	TO				
1.	IF Coil Adj.	Genescope Output 60dB	AM ANT terminal	Between Point ① (Pin 12 of dIC1) & GND (F-5466)	eCF1 (F-5466)	Max, Waveform	
2.	531kHz (or 530kHz) Tuning Adj.	No Input	—	FL Display	TUNING UP, DOWN Button	531kHz (or 530kHz)	
				Between Point ② (eR1, F-5466) and GND, DC Volt Meter	eT3 (F-5466)	1.0V ± 0.1V	
3.	1602kHz (or 1600kHz) Tuning Adj.	No Input	—	FL Display	TUNING UP, DOWN Button	1602kHz (or 1600kHz)	
				Between Point ③ (eR1, F-5466) and GND, DC Volt Meter	eTC2 (F-5466)	8.0V ± 0.1V	
4.	603kHz (or 600kHz) RF Adj.	603kHz (or 600kHz) ANT Input 30dB 400Hz (30% MOD.) AM SSG	ANTENNA Terminal	FL Display	TUNING UP, DOWN Button	603kHz (or 600kHz)	
				Output L or R-ch, Between Point ④ (Jumper wire JW15) or Point ⑤ (Jumper wire JW16) and GND, VTVM, SCOPE	eT1 (F-5466)	MAX. Output	
5.	1404kHz (or 1400kHz) RF Adj.	1404kHz (or 1400kHz) ANT Input 30dB 400Hz (30% MOD.) AM SSG	Same as above	FL Display	TUNING UP, DOWN Button	1404kHz (or 1400kHz)	
				Output L or R-ch, Between Point ⑥ (Jumper wire JW15) or Point ⑦ (Jumper wire JW16) and GND, VTVM, SCOPE	eTC1 (F-5466)	MAX. Output	
6.	LOCKED Indicator Level Adj.	999kHz (or 1000kHz) ANT Input 60dB 400Hz (30% MOD.) AM SSG	Same as above	FL Display	TUNING UP, DOWN Button	999kHz (or 1000kHz)	
				LOCKED Indicator	eVR1 (F-5466)	LOCKED Indicator turns ON.	

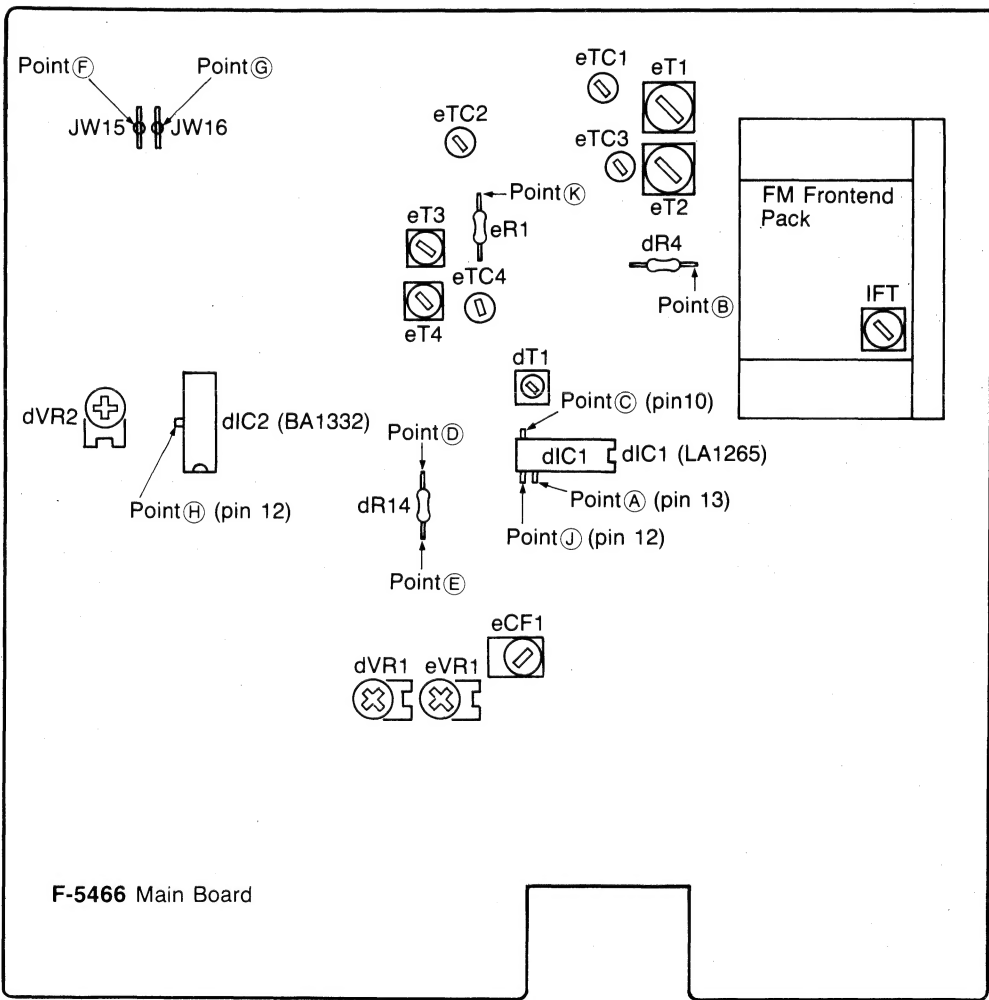
2) LW Tuning Adjustment (T-E70L only) (See Fig. 2-6)

Note: Band Selector LW

STEP	SUBJECT	FEED SIGNAL		MEASURE OUTPUT	ADJUST	ADJUST FOR	REMARKS
		FROM	TO				
1.	153kHz Tuning Adj.	No Input	—	FL Display	TUNING UP, DOWN Button	153kHz	
				Between Point ⑧ (eR1, F-5466) and GND, DC Volt Meter	eT4 (F-5466)	1.0V ± 0.1V	
2.	281kHz Tuning Adj.	No Input	—	FL Display	TUNING UP, DOWN Button	281kHz	
				Between Point ⑨ (eR1, F-5466) and GND, DC Volt Meter	eTC4 (F-5466)	5.4V ± 0.1V	

STEP	SUBJECT	FEED SIGNAL		MEASURE OUTPUT	ADJUST	ADJUST FOR	REMARKS
		FROM	TO				
3.	170kHz RF Adj.	170kHz ANT Input 30dB 400Hz (30% MOD.), AM SSG	ANTENNA Terminal	FL Display	TUNING UP, DOWN Button	170kHz	
				Output L or R-ch, Between Point ⑩ (Jumper wire JW15) or Point ⑪ (Jumper wire JW16) and GND, VTVM, SCOPE	eT2 (F-5466)	MAX. Output	
4.	260kHz RF Adj.	260kHz ANT Input 30dB 400Hz (30% MOD.), AM SSG	Same as above	FL Display	TUNING UP, DOWN Button	260kHz	
				Output L or R-ch Between Point ⑫ (Jumper wire JW15) or Point ⑬ (Jumper wire JW16) and GND, VTVM, SCOPE	eTC3 (F-5466)	MAX. Output	

Fig. 2-6



•Abbreviations

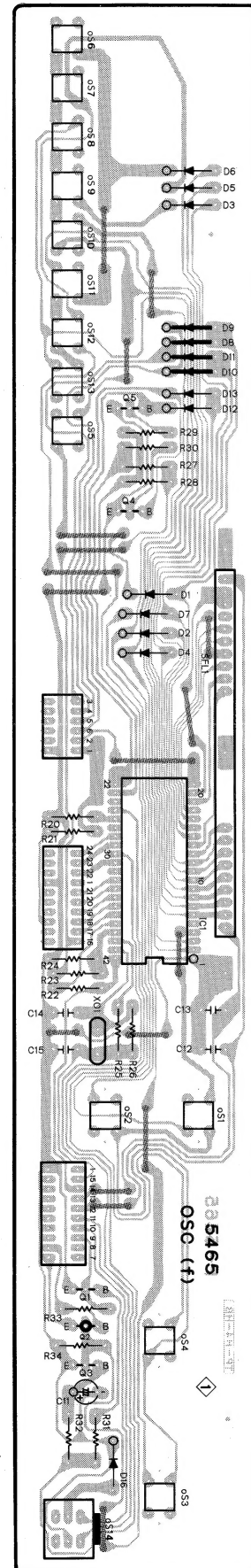
Equipment
AM FM Generator Oscilloscope Genescope
AM Standard Signal Generator AM SSG
FM Standard Signal Generator FM SSG
FM Stereo Generator Stereo SG
Oscilloscope Scope
Audio Oscillator Audio Osc.
Distortion Meter Dist. Meter

Others
Antenna ANT.
Modulation MOD.
Total Harmonic Distortion T.H.D.

3. PARTS LOCATION & PARTS LIST

3-1. F-5465 PLL Synthesizer Board (Stock No. 00997601 = T-E70/00997805 = T-E70L)

Component Side

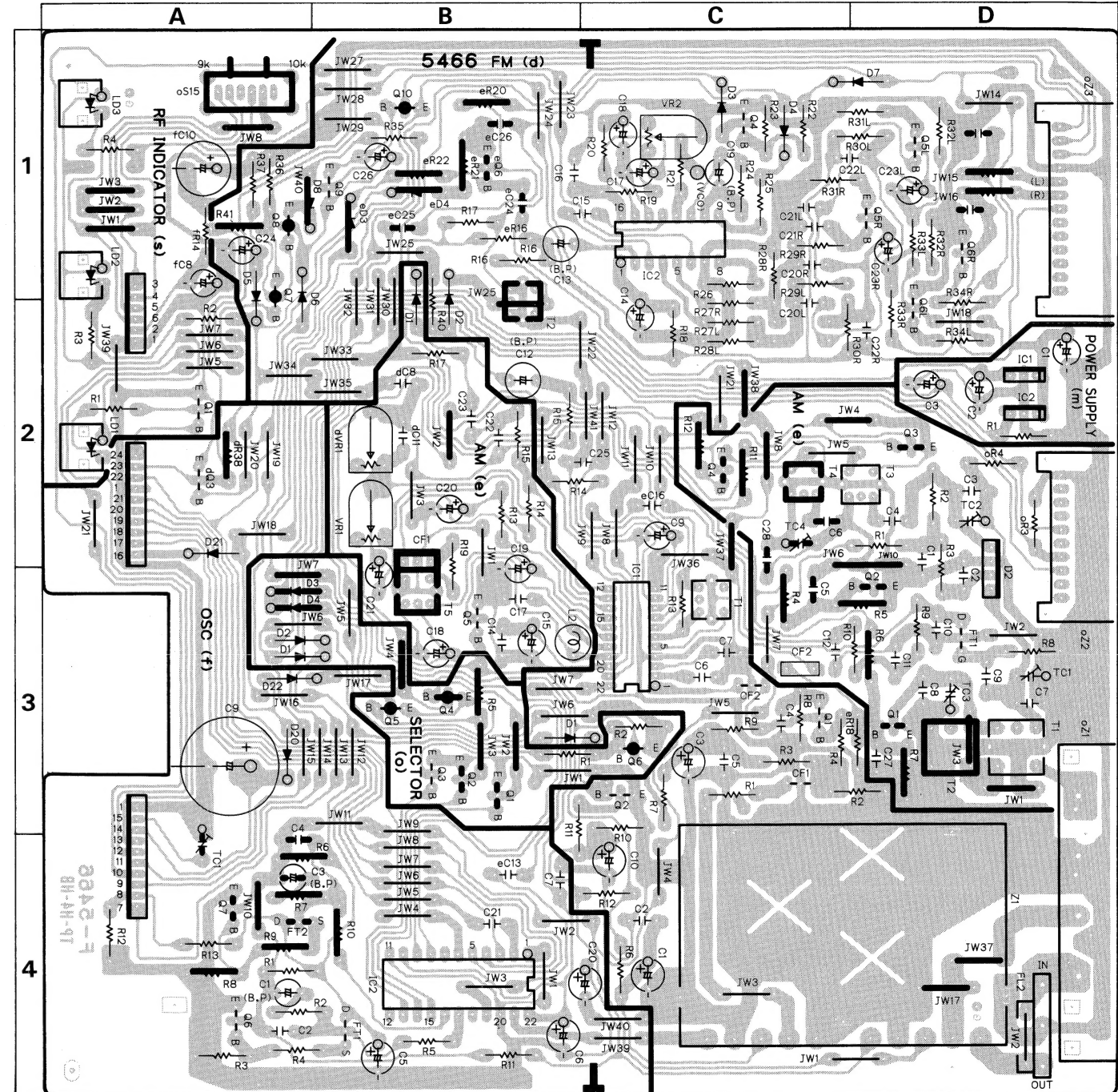


Parts List

Parts No.	Stock No.	Description
• Transistor		
fQ1	46367101	2SC2603
	or 46367301	2SC2458
	or 46391901	2SC2785
fQ2	46367001	2SA1115
	or 46367201	2SA1048
	or 46392001	2SA1175
fQ3	46367101	2SC2603
	or 46367301	2SC2458
	or 46391901	2SC2785
fQ4	46719900	DTC124ES
fQ5	46719900	DTC124ES
• IC		
fIC1	48367800	TC9303AN-002
fXO1	07237700	Quartz Crystal NR-18
• Diode		
fD1	03117600	1S2473T77
	or 46086000	1S1588TP-3
fD2	03117600	1S2473T77
	or 46086000	1S1588TP-3
fD3	03117600	1S2473T77
	or 46086000	1S1588TP-3
fD4	03117600	1S2473T77
	or 46086000	1S1588TP-3
fD5	03117600	1S2473T77
	or 46086000	1S1588TP-3
fD6	03117600	1S2473T77
	or 46086000	1S1588TP-3
fD7	03117600	1S2473T77
	or 46086000	1S1588TP-3
fD8	03117600	1S2473T77
	or 46086000	1S1588TP-3
fD10	03117600	1S2473T77
	or 46086000	1S1588TP-3
fD12	03117600	1S2473T77
	or 46086000	1S1588TP-3
fD16	03117600	1S2473T77
	or 46086000	1S1588TP-3
oS1	46708100	Push SW., TUNING UP
oS2	46708100	Push SW., TUNING DOWN
oS3	46708100	Push SW., AUTO/MANUAL
oS4	46708100	Push SW., FM/AM (MW/LW)
oS5	46708100	Push SW., MEMORY
oS6	46708100	Push SW., 1
oS7	46708100	Push SW., 2
oS8	46708100	Push SW., 3
oS9	46708100	Push SW., 4
oS10	46708100	Push SW., 5
oS11	46708100	Push SW., 6
oS12	46708100	Push SW., 7
oS13	46708100	Push SW., 8
oS14	48313800	Push SW., FM MUTING/MODE
sFL1	48314300	FL. Display Tube FG78M1AGR

3-2. F-5466 Main Board (Stock No. 00997701 = T-E70/00997905 = T-E70L)

Component Side



Parts List

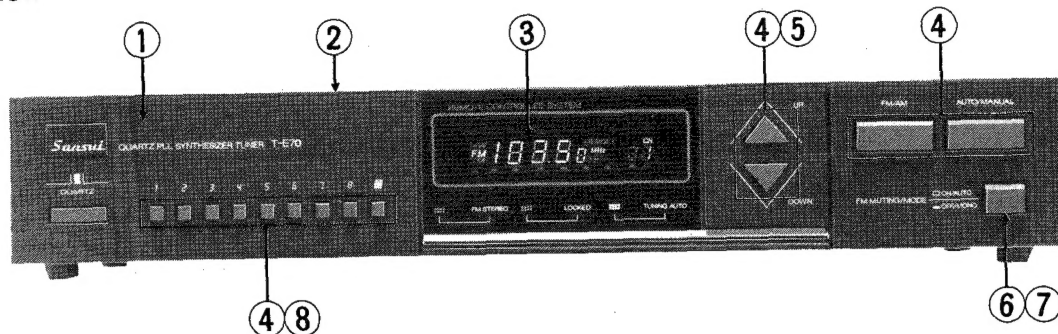
Parts No.	Stock No.	Description	Parts No.	Stock No.	Description
dZ1	48569000	FM Frontend Pack	dQ6	46540801	2SC2878
• Transistor				or 46604301	2SC3327
dQ1	46393201	2SC2786	dQ7	48183400	DTA114YS
dQ2	48230800	DTC143XS	dQ8	48183400	DTA114YS
dQ3	48230200	DTC124XS	dQ9	48171600	DTC114YS
dQ4	46367101	2SC2603	dQ10	48229600	DTA114ES
	or 46367301	2SC2458	• IC		
	or 46391901	2SC2785	dIC1	48568900	LA1265
dQ5	46367101	2SC2603	dIC2	48169300	BA1332
	or 46367301	2SC2458	• Diode		
	or 46391901	2SC2785	dD1	03117600	1S2473T77
				or 46086000	1S1588TP-3

Parts List <F-5466>

Parts No.	Stock No.	Description	Parts No.	Stock No.	Description
dD2	03117600	1S2473T77	eVR1	07241300	10k Ω (B) S.V.R., lock ind. level adj.
	or 46086000	1S1588TP-3	•Transistor		
dD3	03117600	1S2473T77	fQ6	46367101	2SC2603
	or 46086000	1S1588TP-3		or 46367301	2SC2458
dD4	03117600	1S2473T77		or 46391901	2SC2785
	or 46086000	1S1588TP-3	fQ7	46367101	2SC2603
dD5	03117600	1S2473T77		or 46367301	2SC2458
	or 46086000	1S1588TP-3		or 46391901	2SC2785
dD6	03117600	1S2473T77			(T-E70L)
	or 46086000	1S1588TP-3	•FET		
dD7	03117600	1S2473T77	fFT1	46643501	2SK163-K2
	or 46086000	1S1588TP-3		or 46643502	2SK163-L1
dD8	03117600	1S2473T77		or 46643601	2SK117-Y
	or 46086000	1S1588TP-3		or 46643602	2SK117-GR
dC12	48102400	4.7 μ F 25V E.B.	fFT2	46643501	2SK163-K2
dC13	48102400	4.7 μ F 25V E.B.		or 46643502	2SK163-L1
dC19	48103400	1 μ F 50V E.B.		or 46643601	2SK117-Y
dC21	46283100	0.015 μ F 50V F.C.		or 46643602	2SK117-GR
dC22	46282800	8200pF 50V F.C.			(T-E70L)
DCF1	46202500	Ceramic Filter SFE10.7MS2(RED)	•IC		
	or 46202501	Ceramic Filter KBF10.7MU-NAG	fIC2	48161001	TC9182P-2
DCF2	46202500	Ceramic Filter SFE10.7MS2(RED)	•Diode		
	or 46202501	Ceramic Filter KBF10.7MU-NAG	fD20	03117600	1S2473T77
dFL1	46183000	Band Pass Filter BP88001A01		or 46086000	1S1588TP-3
		(T-E70L)	fD21	03117600	1S2473T77
dT1	48568700	FM DET Coil		or 46086000	1S1588TP-3
dVR1	07241300	10k Ω (B) S.V.R., lock ind. level adj.	fD22	03117600	1S2473T77
dVR2	07241200	5k Ω (B) S.V.R., V.C.O adj.		or 46086000	1S1588TP-3
•Transistor			fC1	48103500	2.2 μ F 50V E.B.
eQ1	46540801	2SC2878	fC3	48103400	1 μ F 50V E.B. (T-E70L)
	or 46604301	2SC3327	fC9	48485800	4700 μ F 6.3V E.C.
eQ2	46540801	2SC2878	•IC		
	or 46604301	2SC3327	Δ mlC1	46499800	L78N09
eQ3	46367101	2SC2603		or 48599900	AN78N09
	or 46367301	2SC2458	Δ mlC2	46361200	L78N06
	or 46391901	2SC2785		or 48599600	AN78N06
eQ4	46367101	2SC2603	•Transistor		
	or 46367301	2SC2458	oQ1	48230800	DTC143XS
	or 46391901	2SC2785	oQ2	48230800	DTC143XS
eQ5	48230200	DTC124XS	oQ3	48230800	DTC143XS
eQ6	46393201	2SC2786 (T-E70)	oQ4	48183400	DTA114YS
•FET			oQ5	48183400	DTA114YS
eFT1	46393000	2SK192A-Y	oQ6	46367001	2SA1115
	or 46393001	2SK192A-GR		or 46367201	2SA1048
				or 46392001	2SA1175
•Diode			•Diode		
eD1	03117600	1S2473T77	oD1	03117600	1S2473T77
	or 46086000	1S1588TP-3		or 46086000	1S1588TP-3
eD2	46146300	KV1236Z2 (Variable Capacitor)	oD2	03117600	1S2473T77
eD3	03117600	1S2473T77		or 46086000	1S1588TP-3
	or 46086000	1S1588TP-3	oD3	03117600	1S2473T77
eD4	03117600	1S2473T77		or 46086000	1S1588TP-3
	or 46086000	1S1588TP-3	oD4	03117600	1S2473T77
		(T-E70L)		or 46086000	1S1588TP-3
eTC1	46095700	Trimmer Capacitor 30pF			(T-E70L)
	or 46162900	Trimmer Capacitor 30pF	oZ1	46547300	Antenna Terminal (T-E70, XX & UL)
eTC2	46095700	Trimmer Capacitor 30pF		46410200	Antenna Terminal (T-E70, EU/T-E70L)
	or 46162900	Trimmer Capacitor 30pF	oZ2	48313900	10P ST Socket, compu selector
eTC3	46095700	Trimmer Capacitor 30pF	oZ3	48519900	13P ST Socket, system control
	or 46162900	Trimmer Capacitor 30pF	oS15	46177200	Slide SW., AM 9/10 kHz (T-E70, XX)
eTC4	46095700	Trimmer Capacitor 30pF	•Transistor		
	or 46162900	Trimmer Capacitor 30pF	sQ1	48171600	DTC114YS
eCF1	48069800	Ceramic Filter (T-E70)	•LED		
	48069900	Ceramic Filter (T-E70L)	sLD1	48185200	GL-3NG87
eCF2	46578100	Ceramic Filter BFU-450C10N	sLD2	48185200	GL-3NG87
eL2	46091900	Inductor 39mH	sLD3	46176900	TLS-123
eT1	46394600	AM ANT Coil		or 46470200	SEL2210S
eT2	48577500	LW ANT Coil (T-E70L)			
eT3	48568800	AM OSC Coil			
eT4	48074410	LW OSC Coil (T-E70L)			
eT5	48072000	AM IF Coil			

4. OTHER PARTS

4-1. Front View

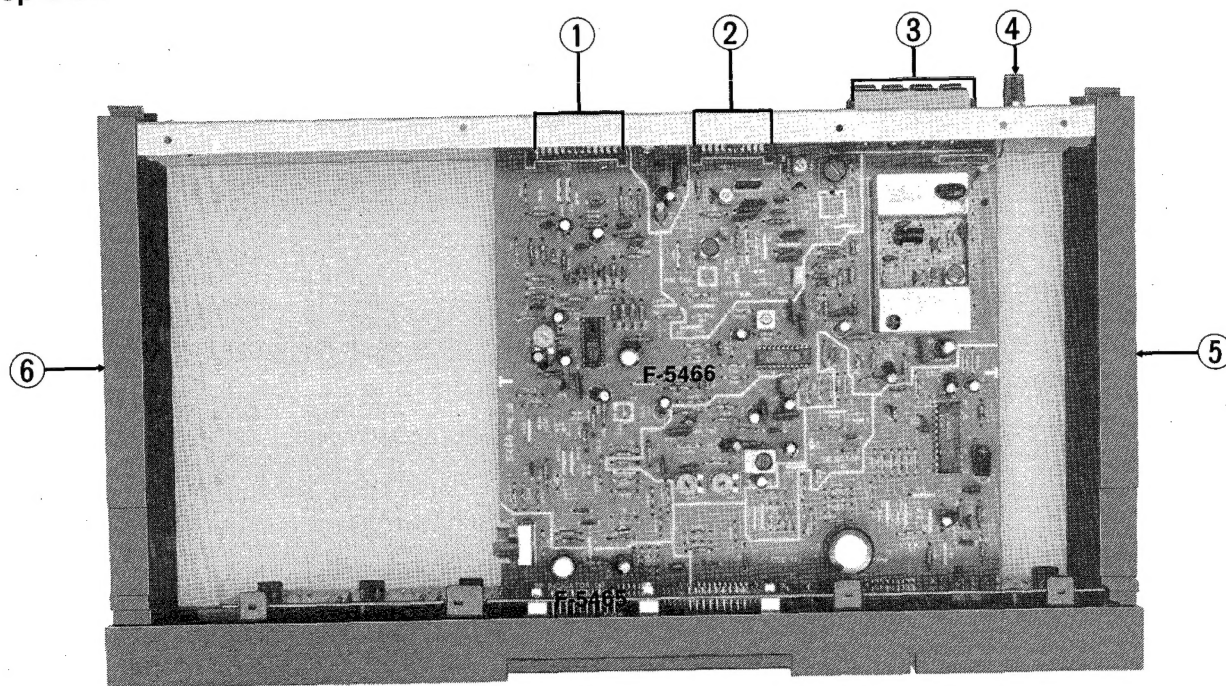


Parts List

Parts No.	Stock No.	Description
1	27238200	Front Panel Ass'y (T-E70)
	27238300	Front Panel Ass'y (T-E70L)
2	27049000	Bonnet
3	48314300	FL Display
4	46708100	Push SW., UP·DOWN·AUTO·MANUAL·MEMORY 1~8

Parts No.	Stock No.	Description
5	27250400	Push Knob, UP·DOWN
6	48313800	Push SW., FM MUTING MODE
7	27237810	Push Knob, FM MUTING MODE
8	27250300	Push Knob, MEMORY 1~8 (Incl. Front Panel Ass'y)

4-2. Top View



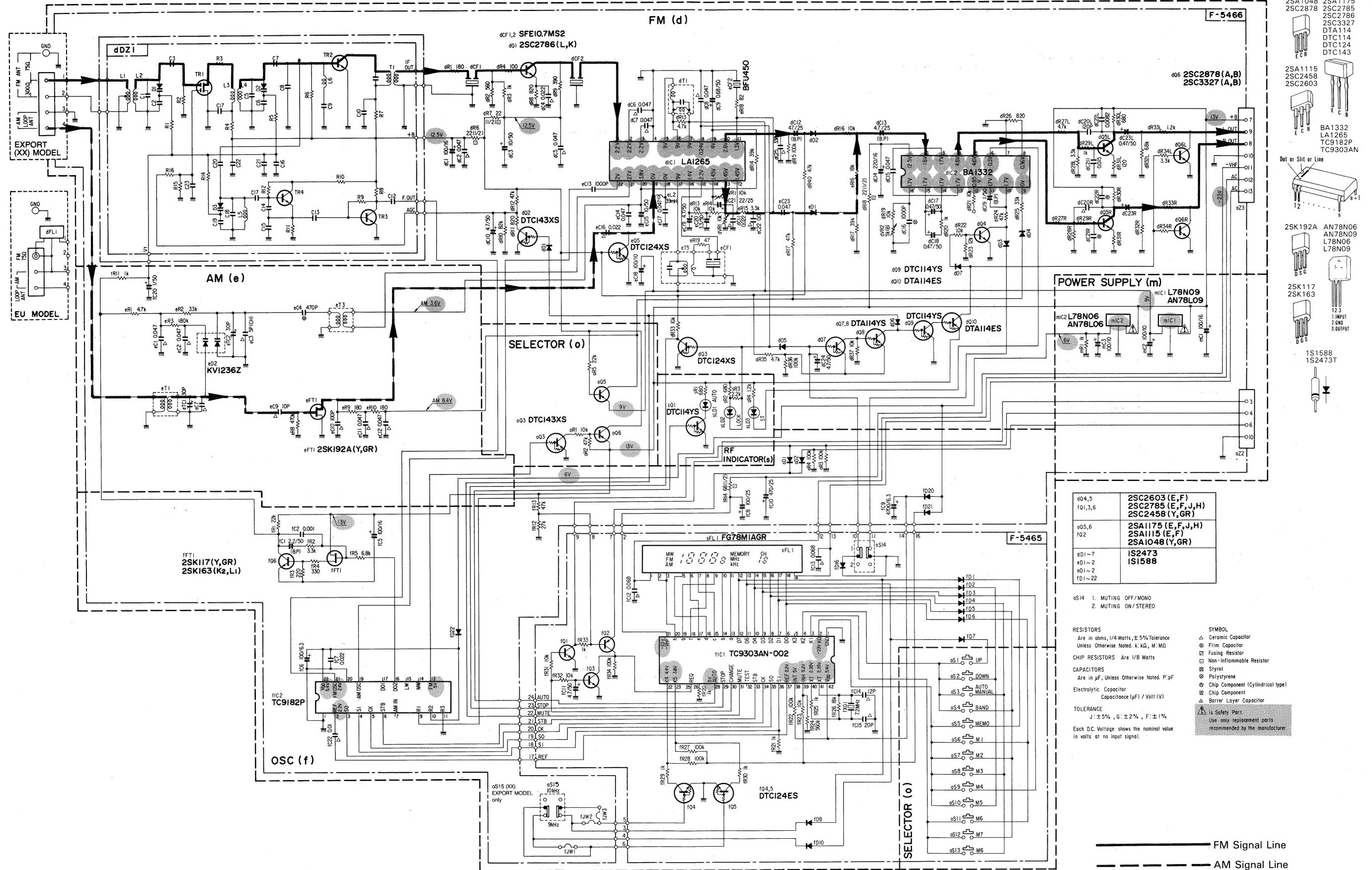
Parts List

Parts No.	Stock No.	Description
1	48519900	13P ST Socket, system control
2	48313900	10P ST Socket, compu selector
3	46547300	Antenna Terminal (T-E70, XX & UL)
	46410200	Antenna Terminal (T-E70, EU/T-E70L)

Parts No.	Stock No.	Description
4	22301510	GND Terminal
5	27106110	Side Panel Ass'y (R)
6	27106200	Side Panel Ass'y (L)

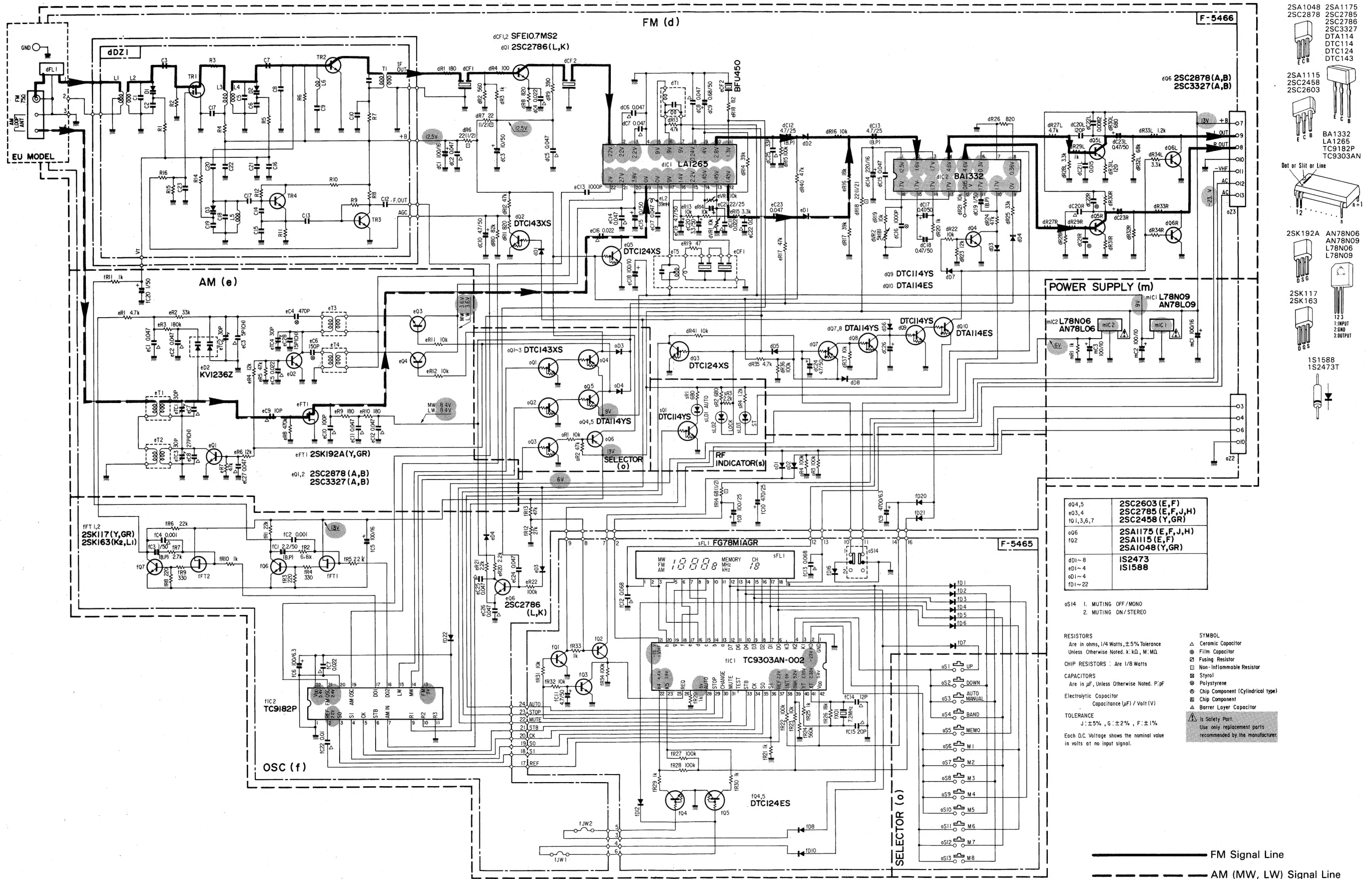
5. SCHEMATIC DIAGRAM 5-1. T-E70

* Design and specifications subject to change without notice for improvement.
 * La présentation et les spécifications sont susceptibles d'être modifiées sans préavis par suites d'améliorations éventuelles.
 * Änderungen, die dem technischen Fortschritt dienen, bleiben vorbehalten.



5-2. T-E70L

* Design and specifications subject to change without notice for improvement.
* La présentation et les spécifications sont susceptibles d'être modifiées sans préavis par suites d'améliorations éventuelles.
* Änderungen, die dem technischen Fortschritt dienen, bleiben vorbehalten.



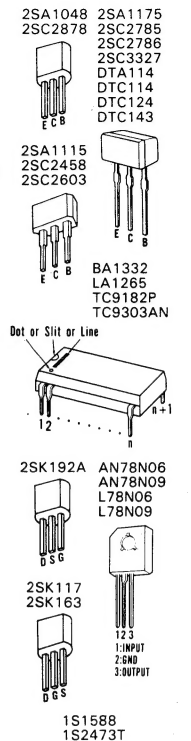
d04,5	2SC2603 (E,F)
e03,4	2SC2785 (E,F,J,H)
101,3,6,7	2SC2458 (Y,G,R)
e06	2SA1175 (E,F,J,H)
102	2SA1115 (E,F)
	2SA1048 (Y,G,R)
d01~8	IS2473
d01~4	IS1588
d01~4	
101~22	

- 0514 1. MUTING OFF/MONO
2. MUTING ON/STEREO

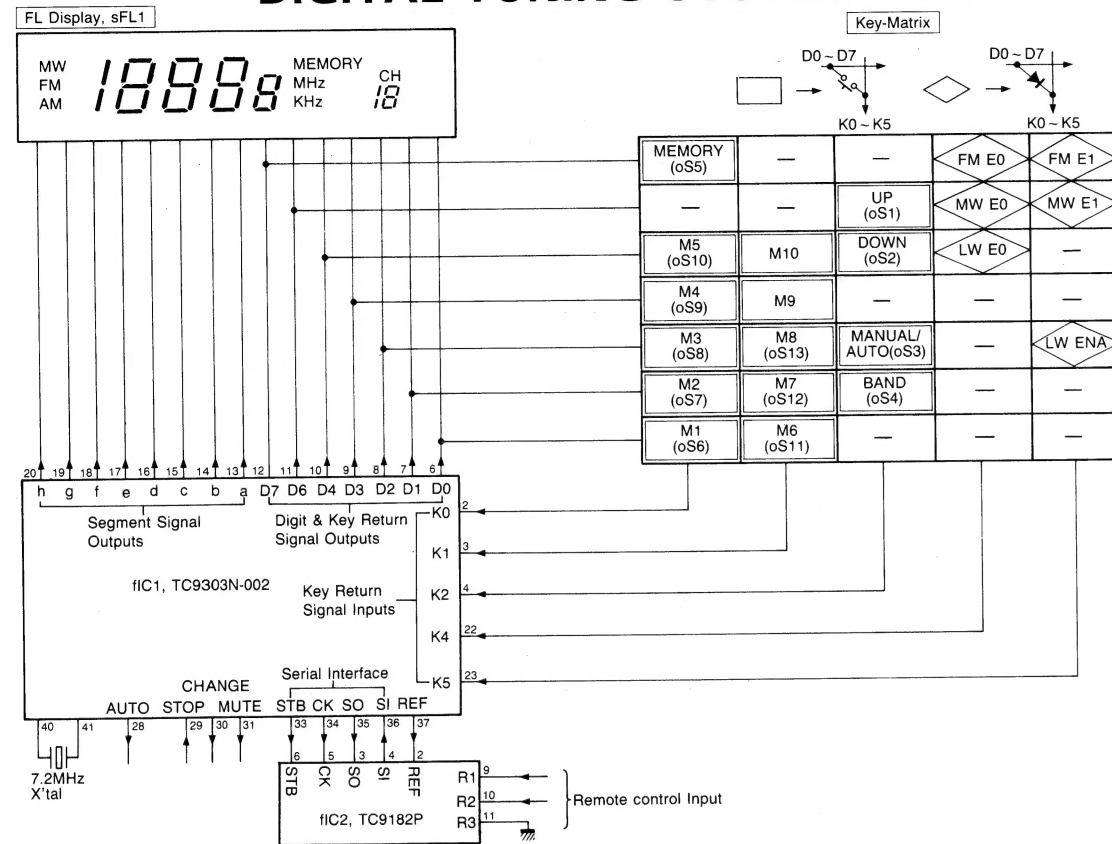
RESISTORS
Are in ohms, 1/4 Watts, $\pm 5\%$ Tolerance
Unless Otherwise Noted: K: k Ω , M: M Ω
CHIP RESISTORS: Are 1/8 Watts
Are in μF , Unless Otherwise Noted: P: pF
CAPACITORS
Are in μF , Unless Otherwise Noted: P: pF
Electrolytic Capacitor
Capacitance (μF) / Volt (V)
TOLERANCE
J: $\pm 5\%$, G: $\pm 2\%$, F: $\pm 1\%$
Each D.C. Voltage shows the nominal value
in volts at no input signal.

SYMBOL
 Δ Ceramic Capacitor
 \square Film Capacitor
 \square Fusing Resistor
 \square Non-Inflammable Resistor
 \square Styrol
 \square Polystyrene
 \square Chip Component (Cylindrical type)
 \square Chip Component
 \square Barrier Layer Capacitor
 Δ is Safety Part.
Use only replacement parts
recommended by the manufacturer.

FM Signal Line
AM (MW, LW) Signal Line



6. DESCRIPTION OF TC9303N-002, DIGITAL TUNING SYSTEM CONTROLLER IC



A. Terminal Function of IC TC9303N

Pin No.	Pin Name	Input/Output	Description
2 ~ 7 22, 23	K0 ~ K3 K4, K5	Input	Ports for inputting a key matrix signal. On the other hand, key return timing signals are outputted from output parts D0 ~ D7.
6 ~ 12	D0 ~ D7	Output	Ports for outputting digit signals to FL display and a key return signal source.
13 ~ 20	a ~ h	Output	Ports for outputting segment signals to FL display.
21	—VFL	—	Terminal for a device supply — voltage.
25	REQ.	Input	Terminal for inputting a request signal for remote controller. When a "H" level signal is applied, remote control data is accepted.
28	AUTO	Output	Terminal for outputting LED driver signal for indicating AUTO during auto search tuning operation. "H" level when active.
29	STOP	Input	Terminal to input a signal for performing the automatic search stop. When a "H" level signal is applied during automatic search operation, the scanning operation stop.
30	CHANGE	Output	Terminal for outputting a changing signal. (For Computer selector signal) In changing, the terminal becomes a "H" level signal. Changing signal is outputted in the following cases: 1. When INH changes from "L" to "H".

Pin No.	Pin Name	Input/Output	Description
30	CHANGE	Output	2. When each input key is depressed normally. 3. When a band key corresponding to the presently received band is depressed. 4. When remote control REQUEST changes to "H" (inclusive NOP.) Request H L 200 ms or more Note: CHANGE is not outputted when INH changes from "H" to "L".
31	MUTE	Output	Terminal to output the muting signal. The kept in "L" level in ordinary state, and in "H" level in muting. The muting signal is outputted in the following. • When "INH" terminal changes from "L" to "H". • When band is switched. • When memory is accessed (in the same band). • In FM manual tuning. • In MW and LW manual tuning. • In AUTO-tuning stop. • When "INH" terminal changes from "H" to "L".
32	TEST	Input	Terminal for inputting a test mode control signal. The device is returned to the ordinary operation at "L" level or NC status. This terminal is fixed at "L" level usually.

Pin No.	Pin Name	Input/Output	Description
33 34 35 36	STB CK SO SI	Output Output Output Input	Serial interfaces for STB (strobe pulse output), CD (serial clock output), SO (serial data output) and SI (serial data input). TC9182P PLL IC is controlled by executing SIO instruction.
37	REF	Output	Terminal for outputting a reference frequency signal supplied to TC9182P PLL IC. Note: This output is fixed at "L" level automatically when INH input is at "L" level.
38	INT	Input	Terminal for inputting a system resetting signal to device. When INT is at "L" level, the device is reset; when at "H" level, program starts beginning from address No.0. This terminal is usually fixed at "H" level, because the device is reset when a voltage of 4.5V is applied to VDD. (power-on reset)
39	INH	Input	Port for inputting a radio mode selection signal. Radio-on mode is set at "H" level; radio-off mode is set at "L" level. When this terminal at "L" level, the REF output is fixed at "L" level automatically.
40 41	X _t X _t	— —	Terminals for connecting a quartz oscillator of 7.2 MHz.
42	VDD	—	Terminal for applying a device supply voltage. In the normal operation, a voltage of 5V ± 10% is applied; but in back-up condition, the voltage can be reduced to 2V. Further, when a voltage of 4.5V is applied to this terminal, the device is reset and then program start beginning from address No.0 (power-on reset).

B. Description of Key Matrix

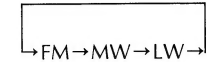
1. Reception Range

	Desti- nation	KEY MATRIX		Reception	IF	Step (kHz)
		E ₀	E ₁			
F M	USA	0	0	87.5 ~ 108.0	+	100
	EU	1	0	87.50 ~ 108.00	+	50
	Japan	0	1	76.0 ~ 90.0	—	100
	SABS	1	1	87.50 ~ 108.00	—	50
M W	USA	0	0	530 ~ 1610		10
	EU	1	0	522 ~ 1611		9
	SAUDI	0	1	531 ~ 1602		9
	Japan	1	1	522 ~ 1629		9
L W		0	—	153 ~ 281		1
		1	—	153 ~ 360		1

2. Band Selection

- When **FM** key is depressed in MW or LW, FM is set.
When **FM** key is depressed in FM band, only CHANGE output is set to "H".
- In the absence of **LW ENA** diode:
 - When **MW/LW** key is depressed in FM, MW is set.
When **MW/LW** key is depressed in MW, only CHANGE output is set to "H".
 - When **BAND** key is depressed or when remote control BAND is requested, FM changes to MW or vice versa cyclically for each one-depression or for each request.
- In the presence of **LW ENA** diode:
 - When **MW/LW** key is depressed in FM, FM changes to MW by the first depression, and thereafter LW changes to MW or vice versa cyclically for each depression.

- When **BAND** key is depressed or when remote control BAND is requested, the reception band changes in sequence as shown below for each depression or for each request:



3. Auto-Search Tuning

Tuning operation stops in case where a stop signal is detected in Auto-Search Tuning operated by depressing **UP** or **DOWN** key.

4. Manual Tuning

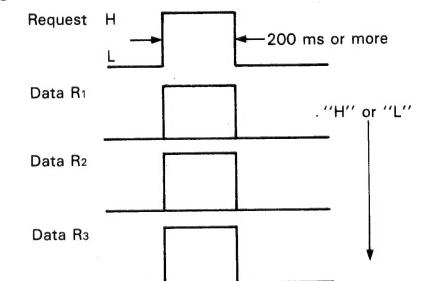
- When **UP** or **DOWN** key is depressed, tuning advances one step for each depression (one step/one push).
- If the key is kept depressed for 0.5 seconds or more, one step/one push tuning changes to continuous tuning. However, when the key is released, the tuning operation stops.
- When tuning reaches one band edge, the tuning operation jumps to another band edge. After a stop interval of 5 seconds, tuning returns to one step/one push tuning or continuous tuning.

5. Preset Memory

- Access to Preset Memory
Preset memory can be accessed by depressing any one of **M1** to **M10** keys or **Mn** and **+10** keys simultaneously.
Note: Accessible by depressing either or both of **+10** keys (D₆-K₀, D₆-K₁).
- Writing
When **MEMORY** key is kept depressed, **MEMORY** and **CH** indications blink at 0.5-sec intervals.
When **Mn** key is depressed simultaneously with **MEMORY** key kept depressed, the present frequency is written in the memory, **MEMORY** indication going off and **CH** indication coming on.

C. Remote Control Input

- Main function
7-kind key input instructions are available in combination with TC 9182.
- Input Port
Remote Control Request input port of TC-9303N and Data R₁, R₂, R₃ input port of TC-9182P.
- Input signals



These request signals are always monitored. All the key input instructions are inhibited when a request signal is at "H". Remote control instructions have priority over others.
A continuous signal is usable for manual up/down tuning operation.

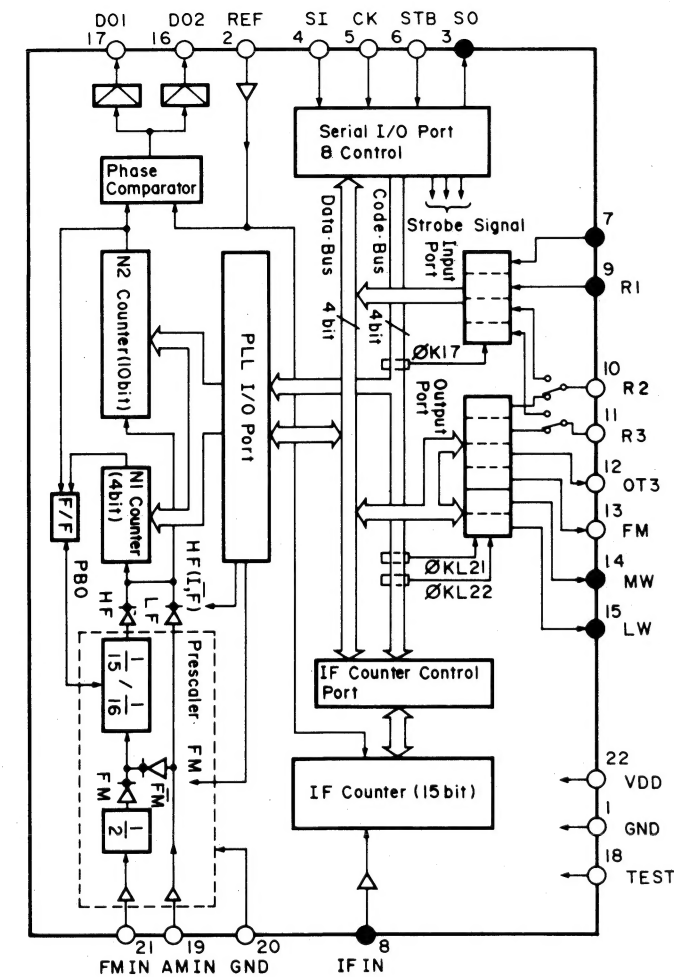
4. Functions

Input Port			Function	
R ₁	R ₂	R ₃		
1	1	1	NOP	Only CHANGE Output
1	1	0	BAND	
0	1	0	MEMORY INCREMENT	
0	0	1	MONO ↔ STEREO	Cyclic
1	0	1	MUTE OFF ↔ ON	Cyclic
0	1	1	DOWN	Continuous
0	0	0	UP	Continuous
1	0	0	MANUAL ↔ AUTO	Cyclic

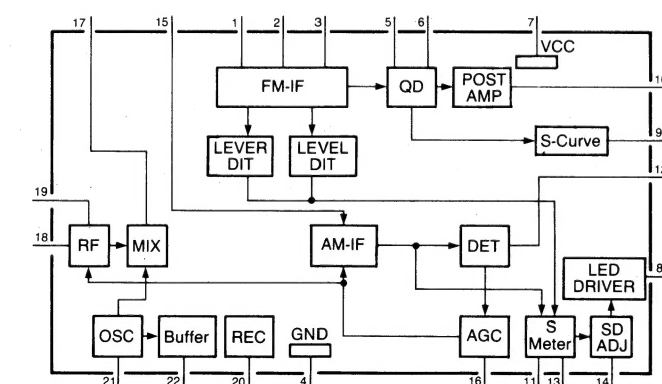
- NOP is an input function for designating tuners and outputs only a CHANGE output.
- The other functions are the same as these of TACT input key.

7. INTERIOR BLOCK DIAGRAM OF IC

•TC-9182P (PLL Synthesizer IC)

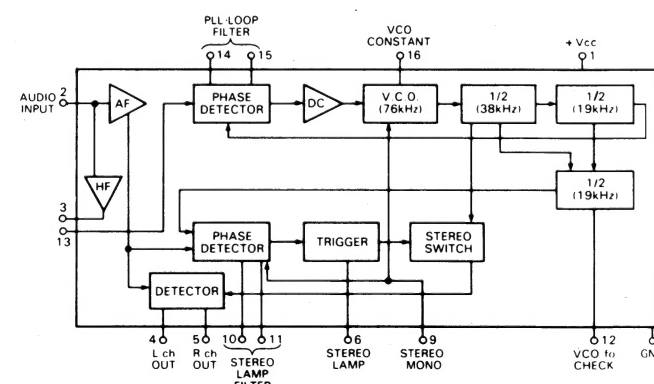


•LA1265 (FM IF, AM RF-IF-OSC IC)



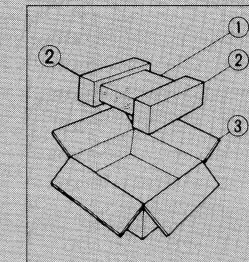
Pin No.	Symbols on substate	Functions
2	REF	Reference frequency signal input terminal
3	SO	Serial data output terminal
4	SI	Serial data input terminal
5	CK	Clock signal input terminal
6	STB	Strobe signal input terminal
		•Terminals to input/output serial data for frequency divider, IF counter and I/O port controller from/to TC-9303N-002 PLL synthesizer control IC.
8	IFIN	Terminal to input IF signal for performing the automatic search stop.
9	R1	Terminals to input signals from the remote controller.
10	R2	7-kind key input instructions are available in combination with TC-9303N-002.
11	R3	
13	FM	Band selector signal output terminal
14	MW	
15	LW	
16	DO2	Terminals to output a signal from a phase comparator.
17	DO1	
18	TEST	Terminal to input a signal of test mode.
19	AMIN	Terminal to input a signal from the AM local OSC.
20	GND	Ground terminal for prescaler
21	FMIN	Terminal to input a signal from the FM local OSC.
22	VDD	Power supply terminals. 5V ± 0.5V
1	GND	Ground terminal

•BA1332 (MPX IC)



8. PACKING LIST

Parts No.	Stock No.	Description
1	27139800	Vinyl Bag
2	27238000	Styrofoam Packing
3	27239700	Carton Case (T-E70)
	27239800	Carton Case (T-E70L)



9. ACCESSORY LIST

Stock No.	Description
46051700	FM Antenna
46186100	AM Loop Antenna
07563000	AM Antenna Holder
48489800	Antenna Matching Transformer (T-E70L)
49014200	T-E70/E70L Operating Instruction (*E·F·S)
49014300	T-E70/E70L Operating Instruction (*G·I·Sw)

*Note:

E·F·S: English·French and Spanish Version
G·I·Sw: German·Italian and Swedish Version

Sansui

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